2.3 Wetland plants and wetland management in Australia

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Abstract

The definition of a wetland and a list of the families and number of genera and species, based on our definition and classified as a waterplant, is included. Types of wetlands in Australia are broadly described. Key management issues are generally covered. The need to focus on adverse catchment influences to receiving waters and early detection of problems before they become unmanageable is emphasised.

Wetland plants

This is one big subject to condense in a few pages.

So what are wetland plants? Good question! There are many definitions and none are adequate given that these plants vary in their tolerance of water and need for it. Some plants thrive and breed in free-water or saturated conditions. Others are tolerant of extended dry conditions but are not killed by long dry periods or occasional floods as occurs along inland rivers and lakes. Sounds logical but what about *Eucalyptus camaldulensis,* River Red Gum, pretty much found along watercourses right across Australia—but if flooded for 12 months may die or lose vigour. Same goes for *Eucalyptus coolabah,* Coolabah, and *Eucalyptus largiflorens,* Black Box. We have excluded many of these river bank and shallow depression plants in our list of wetland plants. But they also could be included along with many floodplain plants—but you have to stop somewhere. The definition is mostly robust but for some plants questionable!

Figure 2.3.1. Late Surrey Jacobs, collecting *Potamogeton tepperi* and *Vallisneria nana*, Bundaberg, Queensland, 1980.

The term facultative and obligate wetland plant is occasionally used to differentiate plants that are tolerant of periodic flooding (facultative) and plants (obligate) that need free-water or saturated conditions to thrive and breed.

In the families Juncaceae and Cyperaceae, known for many highly wet-tolerant plants, there are many species that do not fit our defintion of a waterplant. In Australia Juncaceae comprises 2 genera—*Juncus* and *Luzula*—and approximately 83 species, however only about 25 species of the genus *Juncus* fit our definition of a waterplant. Same applies to Cyperaceae with many waterplants, but out of 45 genera and about 660 species in Australia around 170 qualify as waterplants based on our definition.

There are by our definition around 700 wetland plants contained in 214 genera across Australia. Included are 130 weeds introduced from overseas and in a few cases plants that are native to the east coast and introduced to the west coast of Australia arguably qualify as exotic. Some of the aquatic weeds are highly invasive of lakes, streams and inland rivers that are mostly dry, but with subsurface water continue to thrive.

Table 2.3.1 is a list of the families, initially produced by Surrey Jacobs in 2009, that have waterplants in them and the numbers in each, although some of the genera are undergoing revision.

Wetland management

What is a wetland? There are many definitions. One put forward by Boulton and Brock (1999) is a broad definition, excluding marine aquatic systems but including marine-influenced ones:

A wetland is an area of temporarily or permanently waterlogged land or inundated land, natural or artificial, with water that is standing or running, ranging from fresh to saline and where inundation by water influences the biota and ecological processes occurring at any time.

Table 2.3.1. Waterplants in Australia —families, genera and species.

Family	Genera	Species
Acanthaceae	1	2
Alismataceae	6	11
Amaranthaceae	1	1
Amaryllidaceae	1	4
Apiaceae	3	3
Aponogetonaceae	1	13
Araceae	4	5
Asteraceae	4	5
Azollaceae	1	2
Barringtonaceae	1	2
Brassicaceae	1	4?
Butomaceae	1	1
Cabombaceae	2	2
Callitrichaceae	1	10
Casuarinaceae	1	3
Ceratophyllaceae	1	2
Convolvulaceae	1	2
Crassulaceae	1	1
Cymodoceaceae	5	11
Cyperaceae	25	170
Dicksoniaceae	1	1
Droseraceae	1	1
Elatinaceae	2	2
Eriocaulaceae	1	22
Gleicheniaceae	2	2
Haloragaceae	3?	20?
Hydrocharitaceae	13	30
Isoetaceae	1	10
Juncaceae	1	25
Juncaginaceae	3	28
Lamiaceae	1	1
Lemnaceae	3	9
Lentibulariaceae	1	11

Family	Genera	Species
Lilaeaceae	1	1
Limnocharitaceae	2	2
Lythraceae	3	9
Mangrove families	22	41
Marantaceae	1	1
Marsileaceae	2	8?
Menyanthaceae	2	32
Myrtaceae	1?	3?
Najadaceae	1	10
Nelumbonaceae	1	1
Nymphaeaceae	3	11
Onagraceae	2	8
Parkeriaceae	1	3
Philydraceae	1	1
Poaceae	39	92
Podostemaceae	2	2
Polygonaceae	3	15
Pontederiaceae	3	7
Portulacaceae	2	2
Posidoniaceae	1	8
Potamogetonaceae	2	16
Ranunculaceae	2	11
Ricciaceae	2	2
Rubiaceae	2	4
Ruppiaceae	1	4
Salicaceae	1	11
Salviniaceae	1	1
Scrophulariaceae	9?	20?
Sparganiaceae	1	1
Typhaceae	1	3
Zannichelliaceae	2	7
Zosteraceae	2	6

Figure 2.3.2. Alligatorweed, *Alternanthera philoxeroides*, Barren Box Swamp, Griffith, NSW. This weed remained undetected for many years—despite its obvious presence—during a period when management funding was withdrawn and no one was looking. (Source: Geoff Sainty 1990.)

Across Australia there are many types of naturally occurring wetlands. Inland they are extensive; for example in NSW 5.6% of the area is wetland, 96% of the wetlands are west of the Great Dividing Range and most wetlands are on private land (NSW DPI 2009, Wetlands on Farms). Jacobs (1983) simplistically classified them:

- **Coastal Wetlands** included (i) upland swamps, (ii) rivers and tributaries (iv) floodplain swamps and billabongs (v) coastal lagoons and lakes (vi) estuaries that include mangroves, seagrass and saltmarsh.
- **Mountain or upland lakes and swamps** included (i) perennial lakes (ii) perennial swamps (iii) ephemeral lakes and swamps.
- **Inland Rivers** (i) perennial rivers including anabranches (ii) ephemeral rivers floodplains (iii) billabongs and swamps both overflow and terminating.

In addition there are inland lakes, mound springs, man-made storages, dams, canals, channels, drains, bores, boredrains, farm storages, rice fields, storeage swamps.

Wetland management is a major issue. Wetlands are dependent on their catchment and become a reflection of it. The adage "wetlands aren't wetlands, they're catchment" is brought home by the major changes developed catchments bring.

In theory wetlands that have no development in their catchment in should require no management. But given the movement of exotic pests—for example European Carp and Gambusia, Alligatorweed and Olive Hymenachne—that are transported by road and stream, the need for constant surveillance is necessary no matter how pristine a wetland may be.

Microbes are a key part of wetland productivity and health. The fact that they are not easily seen does not diminish their importance. For a start bacteria decompose organic matter washed in from the catchment and set the food chain in action (Boulton and Brock 1999). Phytoplankton and zooplankton are ignored in most wetland assessments but are critical to maintain their function. Cyanobacteria or blue-green grow in all wetlands and only when numbers reach a prescribed level are they potentially harmful. Otherwise they are an essential part of the system.

There are many ways wetland health and productivity can be changed. Wetlands are influenced by hydrology—change the water amount, depth and frequency and change the wetland. These systems are full of surprises. Acid sulphate soils can be made toxic by draining and exposure to air. Water quality—salinity, turbidity, enrichment, oxygenation—to a lesser or greater extent influence the processes and biota in wetlands. Agriculture and industry has brought many changes. Unrestricted stock access pugs the soil, muddies the water and increases erosion. There has been significant loss of coastal salt and freshwater wetlands and this is increasing as population grows along the coast. Weeds also have the potential to invade wetlands and are often an issue where the level of disturbance and enrichment is high. If you are involved in management of wetlands you need to keep a finger on their pulse otherwise changes will take place while you are not watching.

As described there are many reasons that wetlands deteriorate. Identifying problems before they become unmanageable is the key. Wetlands respond to regular care and attention.

References

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